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INF3705   (494719)   October/November 2017

ADVANCED SYSTEMS DEVELOPMENT

Duration   2 Hours   100 Marks

Examiners:
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Second: **Dr V Horner**
External: **Prof. R Kekwaletswe**

Closed book examination

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This examination question paper consists of 6 pages plus instructions for the completion of a mark-reading sheet

<u>INSTRUCTIONS</u>

1   Answer section A on the mark-reading sheet, and the rest of the questions in the answer book

2   All rough work must be done in the answer book

3   The mark for each question is given in brackets next to the question

4   Please answer the questions in the order in which they have been set If you wish to leave out a question temporarily and come back to it later, leave sufficient space for it in your answer book

SECTION A: MULTIPLE-CHOICE QUESTIONS [50 MARKS**]

1 Which one of the following is not an essential attribute of good software development?

    1 Maintainability
    2 Dependability and security,
    3 Efficiency and acceptability
    4 Competence

2 The two fundamental types of software product are_____

    1 Generic products and customized products
    2 Company product and generic product
    3 Company product and customized product
    4 Company product and developer product

3 An engineering discipline which deals with all aspects of software production from specification to system maintenance is termed_____

    1 System engineering
    2 Software engineering
    3 Product engineering
    4 Tools engineering

4 Which of this general issue does not affect software development?

    1 Heterogeneity
    2 Business and social change
    3 Security and trust
    4 Confidentiality

5 Which of the following is appropriate for the incremental model of software development?

    1. When developments methods are flexible
    2 When the process of software development is well defined
    3 When a core product is required quickly
    4 All of the above

6 The most appropriate situation for agile method of software development is_____

    1 When developments methods are flexible
    2 When the process of software development is well defined
    3 When requirements are well known in advance
    4 All of the above

7 Which of the following needs to be assessed during unit testing?

    1 Algorithmic performance
    2 Code stability
    3 To test during development
    4 All of the above

8 What is the purpose of load testing?

    1 To test the response rate of the system
    2 To test the number of transactions that the system can handle simultaneously
    3 To test during development
    4 All of the above

9 The purpose of performance testing is to_____

    1 To test the response rate of the system
    2 To test the number of transactions that the system can handle simultaneously
    3 To test during development
    4 All of the above

10 Which of the following involves Usability testing?

    1 Deployment testing
    2. Requirements validation
    3 Load testing
    4 All of the above

11. As a system developer, which of the following are elements to be considered in systems design?

    1 Architecture, data and interfaces
    2 Data interfaces and project scope
    3 Systems models.
    4 All of the above

12 Which of the following are concerns of software engineering?

    1 Architecture, data and interfaces
    2 Data interfaces and project scope
    3 Systems models
    4 All of the above

13 An architectural style encompasses which of the following elements?

    1 Constraints
    2 Set of components
    3 Semantic models
    4 All of the above

14 To determine the architectural style or combination of styles that best fits any proposed system, requirements engineering is used to uncover _____

    1 Algorithmic complexity
    2 Characteristics and constraints
    3 Control and data
    4 Design patterns

15 Which of the following are elements of systems requirements?

    1 Architecture, data and interfaces
    2 Data, interfaces and project scope
    3 Systems models
    4 All of the above

16 Which of the following is preferable of software modules?

    1 Low cohesion and high coupling
    2 High cohesion and high coupling
    3 High cohesion and low coupling
    4 It depends on the situation

17 Cyber security dealing with secrecy or confidentiality threats is referred to as_____

    1 Unauthorized modification of data
    2 Denial of access to data and services
    3 Unauthorized viewing of data
    4 All of the above

18 Integrity threats refer to one of the following

    1 Unauthorized modification of data
    2 Denial of access to data and services
    3 Unauthorized viewing of data
    4 All of the above

19. Denial of access or availability threats refers to _____

    1. Unauthorized modification of data
    2 Denial of access to data and services
    3 Unauthorized viewing of data
    4 All of the above

20 Which of the following can be classified as a Model–View-Controller (MVC) architectural pattern?

    1 It has three components
    2 Has clients and servers
    3 It is a sequential model of processing
    4 None of the above

21 Prototyping involves development of _____

    1 Initial demonstration of concepts
    2 A final product
    3 A stable product
    4 Beta version of the product

22 Which of the following is an attribute of a dependable software engineering process?

    1 Documentable
    2 Standardized
    3 Auditable
    4 All of the above

23 Redundancy and diversity are fundamental strategies in the dependability of a system Which of the   following is an *example of diversity?*

    1 A spare/extra capacity
    2 Object oriented design
    3 Avoiding a single point of failure
    4 All of the above

24 Which of the following exploits on reusable components in its design?

    1 A backup mechanism
    2 Object oriented design
    3 Avoiding a single point of failure
    4 All of the above

25 Socio -Technical systems is made up of different components including_____

    1 Equipment
    2 Operating system
    3 Society
    4 All of the above

SECTION B: STRUCTURED QUESTIONS   [50 MARKS]

QUESTION 1   [10]

Members of your software development team think that agile methods should be based on principles Explain the principles of agile methods to the team members

QUESTION 2   [6]

2 1 What are the fundamental concepts of user and system requirements?
2 2 Why is it important that these requirements be written in different ways?

QUESTION 3   [10]

As a system developer, your organization requires you to make a decision on system architecture Explain to your organization members what decisions have to be made about the system during the architectural design process?

QUESTION 4   [8]

Development testing forms an integral aspect of system development Explain the following, unit testing, component testing and system testing

QUESTION 5   [8]

Briefly describe three main types of software maintenance Why is it sometimes difficult to distinguish between them?

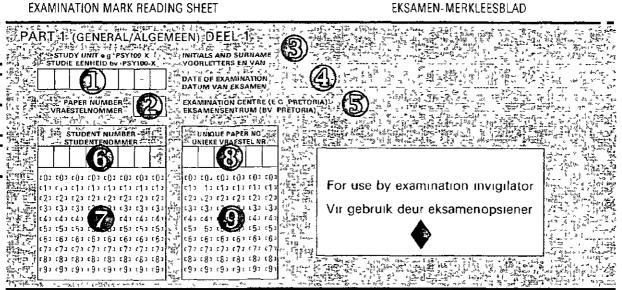### QUESTION 6   [8]

What are the strategic options for legacy system evolution? When would you normally replace all or part of a system rather than continue maintenance of the software?

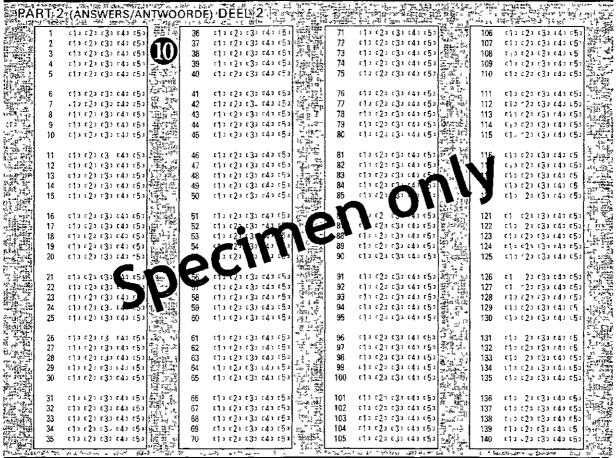# UNIVERSITY OF SOUTH AFRICA UNISA UNIVERSITEIT VAN SUID-AFRIKA

EXAMINATION MARK READING SHEET

EKSAMEN-MERKLEESBLAD

PART 1 (GENERAL/ALGEMEEN) DEEL 1

STUDY UNIT e g "PSY100 X
STUDIE EENHEID bv PSY100-X ①

INITIALS AND SURNAME ③
VOORLETTERS EN VAN

DATE OF EXAMINATION ④
DATUM VAN EKSAMEN

PAPER NUMBER ②
VRAESTELNOMMER

EXAMINATION CENTRE (E G PRETORIA) ⑤
EKSAMENSENTRUM (BV PRETORIA)

STUDENT NUMBER ⑥
STUDENTENOMMER ⑦

UNIQUE PAPER NO ⑧
UNIEKE VRAESTEL NR ⑨

For use by examination invigilator

Vir gebruik deur eksamenopsiener ◆

IMPORTANT	BELANGRIK
1 USE ONLY AN HB PENCIL TO COMPLETE THIS SHEET	1 GEBRUIK SLEGS N HB POTLOOD OM HIERDIE BLAD TE VOLTOOI
2 MARK LIKE THIS	2 MERK AS VOLG
3 CHECK THAT YOUR INITIALS AND SURNAME HAS BEEN FILLED IN CORRECTLY	3 KONTROLEER DAT U VOORLETTERS EN VAN REG INGEVUL IS
4 ENTER YOUR STUDENT NUMBER FROM LEFT TO RIGHT	4 VUL U STUDENTENOMMER VAN LINKS NA REGS IN
5 CHECK THAT YOUR STUDENT NUMBER HAS BEEN FILLED IN CORRECTLY	5 KONTROLEER DAT U DIE KORREKTE STUDENTENOMMER VERSTREK HET
6 CHECK THAT THE UNIQUE NUMBER HAS BEEN FILLED IN CORRECTLY	6 KONTROLEER DAT DIE UNIEKE NOMMER REG INGEVUL IS
7 CHECK THAT ONLY ONE ANSWER PER QUESTION HAS BEEN MARKED	7 MAAK SEKER DAT NET EEN ALTERNATIEF PER VRAAG GEMERK IS
8 DO NOT FOLD	8 MOENIE VOU NIE

PART 2 (ANSWERS/ANTWOORDE) DEEL 2

⑩

Specimen only

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MARK READING SHEET INSTRUCTIONS

Your mark reading sheet is marked by computer and should therefore be filled in thoroughly and correctly

USE ONLY AN HB PENCIL TO COMPLETE YOUR MARK READING SHEET

PLEASE DO NOT FOLD OR DAMAGE YOUR MARK READING SHEET

Consult the illustration of a mark reading sheet on the reverse of this page and follow the instructions step by step when working on your sheet

Instruction numbers ❶ to ❿ refer to spaces on your mark reading sheet which you should fill in as follows

❶ Write your paper code in these eight squares, for instance

P	S	Y	1	0	0	-	X

❷ The paper number pertains only to first-level courses consisting of two papers

WRITE | 0 | 1 | for the first paper and | 0 | 2 | for the second If only one paper, then leave blank

❸ Fill in your initials and surname

❹ Fill in the date of the examination

❺ Fill in the name of the examination centre

❻ WRITE the digits of your student number HORIZONTALLY (from left to right) Begin by filling in the first digit of your student number in the first square on the left, then fill in the other digits, each one in a separate square

❼ In each vertical column mark the digit that corresponds to the digit in your student number as follows [-]

❽ WRITE your unique paper number HORIZONTALLY

NB Your unique paper number appears at the top of your examination paper and consists only of digits (e g 403326)

❾ In each vertical column mark the digit that corresponds to the digit number in your unique paper number as follows [-]

❿ Question numbers 1 to 140 indicate corresponding question numbers in your examination paper The five spaces with digits 1 to 5 next to each question number indicate an alternative answer to each question The spaces of which the number correspond to the answer you have chosen for each question and should be marked as follows [-]

◆ For official use by the invigilator Do not fill in any information here